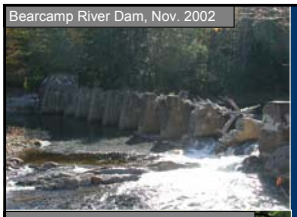


Restoring Rivers, One Dam Removal At A Time

By Stephanie Lindloff, DES River Restoration & Dam Removal Coordinator

River and Watershed Conference
November 8, 2003

Talk Outline

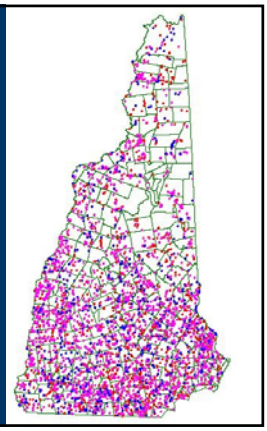
- Brief overview of:
  - Dams in New Hampshire
  - Dam Removal and River Restoration Program
- Removing a Dam in New Hampshire
  - Importance of Stakeholder Involvement and Approaches to Consider
  - Primer on Regulatory Requirements
  - Key issues to address/incorporate early
- Bearcamp River Dam removal
- Other projects in the works
- Video (22 min.)

How Many Dams are in New Hampshire?

National Inventory of Dams (NID) = **625**

NID + Remaining Active Dams = **3,200**

NID + Active + Inactive Dams = **4,866 dams in the state database**



What are the Functions of New Hampshire's

Use	% of
Recreation	36
Stormwater Detention Pond	15
Conservation/Agriculture	14
Other	12
Fire Protection	8
Hydropower	5
Water Supply	3
Flood Control	2
Sewage Lagoon	2

A default category that includes many old mill dams.

Only a small number currently produce or can produce hydropower.

Very few provide flood control. Many exacerbate flooding.

River Restoration Task Force

Formed in January 2000

A public-private collaboration restoring rivers and eliminating safety hazards through selective dam removal.

Goal: An efficient and effective process for removing dams and restoring rivers

Operates at both statewide and project-specific levels

GOVERNMENT AGENCIES

- National Oceanic and Atmospheric Administration Restoration Center
- U.S. Army Corps of Engineers
- U.S. Department of Agriculture, Natural Resource Conservation Service
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- U.S. Geological Survey
- U.S. National Park Service
- N.H. Department of Environmental Services
- N.H. Fish and Game Department
- N.H. Office of Emergency Management
- State Historic Preservation Office

NON-PROFIT GROUPS

- American Rivers
- Ashuelot River Local Advisory Committee
- Coastal Conservation Association
- Coldwater Fisheries Coalition
- Connecticut River Watershed Council
- Conservation Law Foundation
- Merrimack Valley Paddlers
- N.H. Rivers Council
- Trout Unlimited
- The Nature Conservancy

The River Restoration Program Assists…

Dam Owners
General Public
Government Agencies
Consulting Community

… with information about dam removal, such as
- basics about dam removal & river restoration
- the latest research and available resources
- appropriate methods for a specific site

… in obtaining funding to offset costs of dam removal and associated work

… throughout the planning, decision-making and regulatory process

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Major Program Accomplishments
Since 2001

- ☑ Developed a single application permitting process for dam removal & the *Guidebook to Regulatory Requirements for Dam Removal Projects*.
- ☑ Removed three dams (Ashuelot and Bearcamp rivers). At least three planned for 2004.
- ☑ More than a dozen projects in the decision-making and planning stages.
- ☑ Raised more than $0.5 million to fund projects.

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How is a Dam Removal Project Initiated?

Dam owner contacts DES to remove dam
Dam owner responds to DES dam safety inspection, chooses to remove not repair
Dam is ownerless or abandoned
Dam is in disrepair and owner fails to respond to order for repair
Dam owner is approached by someone with an interest in removal and owner chooses to remove

Bottom Line:
The State cannot force removal of a dam if:
1) the dam has an identifiable owner AND
2) it is maintained in safe condition.

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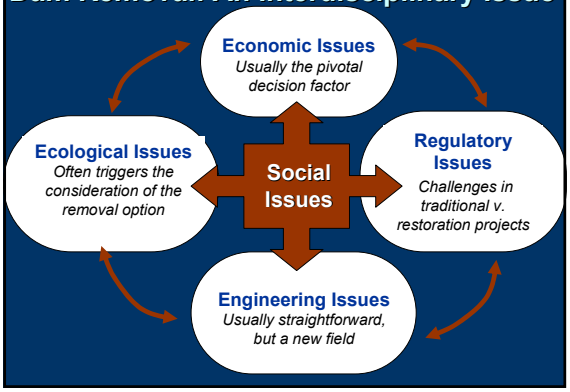
Dam Removal: An Interdisciplinary Issue



Challenges of an Interdisciplinary Issue

Multiple Disciplines = Multiple Approaches
See Handout: "A Professional's View"

Focusing on the various technical issues can result in overlooking social aspects of the issue.

This can affect all steps of the project.
As well as the precedent-setting nature of the project for both the issue and future relationships

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Study of Dam Decision Processes in Wisconsin

(Born et al. 1996, 1998)

Based on a review of 14 dam decisions:
Dam safety orders triggered most dam repair or removal decisions.

Decisions were often made:
Under a tight timeline (both actual and perceived)
Based upon incomplete and inaccurate information
In a highly charged & divisive atmosphere

Franklin Dam removal, Sheboygan River, Wis., 2001

But, what is "the process"?

There are actually several "decision processes":

- decision-making
  Personal, court of public opinion, formal
- regulatory
- project planning & implementation
- site restoration & associated projects

Key Question:
When is there usually opportunity for public involvement in these processes?

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Traditional Public Involvement Processes

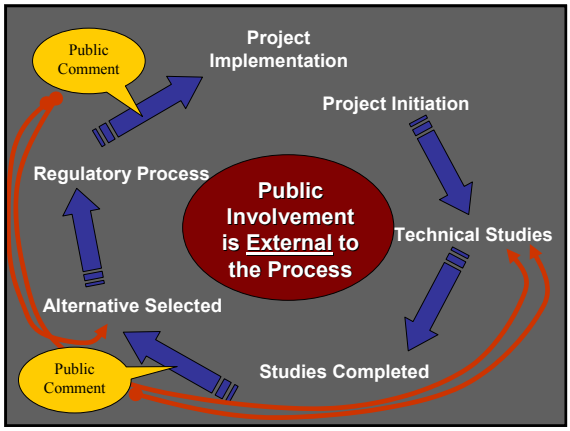
Required by law at certain points

Predictable, known commodity

Often limited direct public involvement in decision-making

Very little public input in designing and planning project

Therefore …
it tends to be reactionary



Pitfalls of the Traditional Process

Inefficient from many perspectives

Reluctance to buck status quo
- Leads to knee-jerk reactions

Divisive atmosphere

Problems with escalation and entrapment
- – Emotions can overwhelm logic
- – Can lead to similar behavior among all interests
- – Conflict and positioning only intensifies

How are Conflicting Interests Addressed in a Traditional Process?

Underlying values are often the ultimate arbiters of the political decision-making process.

An agency's purpose is to apply & enforce the law, not to reconcile conflicting interests.

A court's purpose is to interpret the law, not to reconcile conflicting interests.

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Key Challenge: Risk & Uncertainty

Three primary types with dam projects:

When information is insufficient to explain and interpret. ***We need more! We have enough!***

When information conflicts
Well, if the 'experts' can't agree…

When interpreting the information relies upon new theories and frameworks

Our community doesn't want to be your guinea pig!

But … What is the *Basis* of the Dispute?

It often isn't about the data or analysis, but about:

- Conflict over interests (perceived or actual)
- Different criteria for evaluation
- Different goals, values, ways of life
- Reactions to unequal power, control, authority (perceived or actual)
- Uncertainty because it's a "new thing"

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Breaking Free of the Traditional Process

- Convene a coordinating committee/work group with diverse representation. Ideal to have a local person convene process, and assist in determining group make-up.
- Ideal to have a coordinator who is perceived as neutral.
- Identify the process. Focus on process (e.g. a well-informed decision), rather than the decision point.

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Breaking Free, cont'd

- Identify critical issues *early in the process* that are outside the realm of "hard science". Avoid the urge to take a scientific approach to addressing issues that are value-based.
- Engage in joint fact-finding. Increase ownership in discovery and learning process.
- Provide a public informational session(s) on issues prior to official proceedings.

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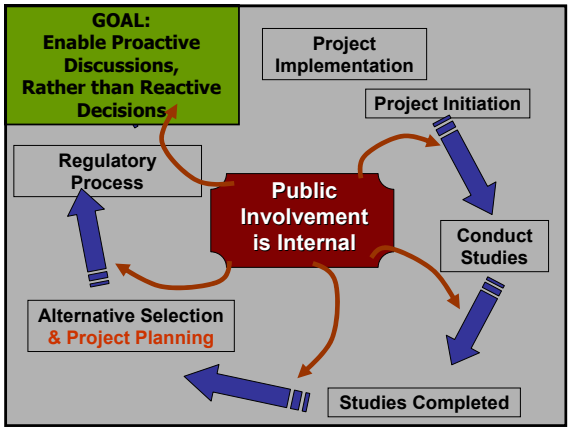

Instilling a community vision of the restored resource is a critical component.

Woolen Mills Dam, Milwaukee River, West Bend, Wis.

One week after removal, Winter 1988

Johns River Dam, Whitefield

Photo Rendering by Stephanie Lindloff

Actual impoundment

Photo Rendering (simulation)

Keep in Mind

Adequately addressing social components throughout the process is generally *more art than science.*

Conflict should not be suppressed. It is an opportunity to learn and progress.

More uncertainty may require more adaptive implementation
(e.g., on-going monitoring, revisiting the site over time).

Accept the fact that you may need to "go slow to go fast."

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Guidelines to Regulatory Requirements for Dam Removal

Web-based document:
www.des.nh.gov/dam/damremoval

Introduction
- Why Consider Dam Removal?

State Laws and Rules Affecting Dam Removal Projects
- RSA 482 (Dams, Mills and Flowage Act)
- RSA 482-A (Dredge and Fill in Wetlands)
- RSA 483 (Rivers Management and Protection Program)
- RSA 483-B (Comprehensive Shoreland Protection Act)
- RSA 227-C (Historic Preservation)

Restoring Rivers, One Dam Removal At A Time

Guidelines continued

A "Four Step Process" to Removing a Dam

Detailed Flow Chart of Process
- Step One: Obtain Necessary Information
- Step Two: Research, Plan and Design the Project
  - Key Technical Issues to Address Early
    - Sediment Issues
    - Historical Resources
    - Effects to Infrastructure
- Step Three: Prepare Permit Applications and Supporting Materials
  - Completing the Application Forms
  - Permit Application Checklist
- Step Four: Permit Review and Issuance

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Step One: The Basics
- Determine project need and interest
- Learn about regulatory requirements
- Identify potential funding opportunities
- Contact DES River Restoration & Dam Removal Coordinator for information

Step Two: Feasibility Assessment
- Stakeholder involvement and outreach
- Data collection
- Identify key issues
- Develop conceptual plan for project

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Data Collection

ENGINEERING
- TYPE & CONDITION OF DAM
- SITE LIMITATIONS (Utilities, Topography)
- UPSTREAM & DOWNSTREAM ISSUES (bridges/structures, tributaries)
- PROJECT PERMITTING
- ALTERNATIVES ANALYSIS

SOCIOECONOMIC
- OWNERSHIP (Dam & Water Rights; Easements)
- CURRENT USES
- RECREATION
- PUBLIC SAFETY
- ECONOMIC ANALYSIS
- ARCHEOLOGICAL/HISTORICAL
- SENTIMENTAL VALUE
- AESTHETICS

ECOLOGY
- ANADROMOUS & RESIDENT FISHERIES
- AQUATIC HABITAT
- HABITAT FRAGMENTATION
- ECOLOGICAL INTERCONNECTIONS
- VEGETATION
- WILDLIFE
- SPECIES OF SPECIAL CONCERN

WATER QUALITY
- CHEMICAL PROPERTIES
- PHYSICAL PROPERTIES (i.e. temperature, turbidity)
- PUBLIC HEALTH

HYDROLOGY
- WATERSHED HYDROLOGY
- FLOODWATER STORAGE
- IMPOUNDMENT DRAWDOWN
- WELL IMPACTS

HYDRAULICS
- CHANNEL HYDRAULICS (& safety)
- FLOODPLAIN HYDRAULICS
- ICE JAMS

FLUVIAL MORPHOLOGY
- TESTING (quality & quantity)
- SEDIMENT STABILITY/TRANSPORT
- SEDIMENT MANAGEMENT
- SEDIMENT DISPOSAL
- CHANNEL MORPHOLOGY/DESIGN (form, function, process, materials)
- SITE RESTORATION

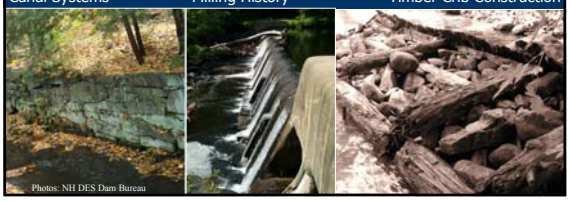
Compiled by Laura Wildman, P.E.

Key Technical Issue: Historic Resource Review

Program has collaborated with State Historic Preservation Office to create Generalized Guidelines for studying dam removal projects.

National Historic Preservation Act:
It's critical to involve historic resource interests early and throughout the process.

Canal Systems | Milling History | Timber Crib Construction



Photos: NH DES Dam Bureau

Historic Resource Review Process

- Determine the "undertaking"
- Could the project affect historic properties?
- Identify historic resources through a professional study and public consultation. Public informational meeting(s) need to be held.
- Formal evaluation of historic significance by the Division of Historical Resources
- If historically significant resources could be adversely affected, identify ways to avoid, minimize or mitigate effects of project.
- Develop a Memorandum of Agreement with stipulations on project.
  This is a requirement to receive federal permits or funding, and a important opportunity for the public to request certain conditions for the project to take place.

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Key Technical Issue: Sediment Management

Quality

- Need to review historic and current sources of upstream pollution.
- Chemical and physical analyses may be necessary.
- DES has an official policy on evaluating sediment quality.
- DES also has a protocol specific to dam removals.
  - At least four samples
  - Grain-size distribution
  - A suite of chemical analyses (PAHs, PCBs, pesticides, metals, VOCs and SVOCs)
- Sediment screening level contaminant lists are different than soil threshold tables.

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Sediment cont'd

Quantity

- Bathymetric data may be required.
- Multiple hand cores, combined with physical and chemical analyses gives important information.
- More detailed sediment transport modeling may be necessary for certain projects.
  - Need to put in context with system capabilities
  - 2D or even 3D modeling of transport may be justified, especially with upstream infrastructure issues.

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Step Three: Decision to Proceed and Permit Application Preparation

- Continuing public involvement and outreach
- Complete application package, including:
  - Standard Dredge and Fill Application
  - Attachment for Dam Removal Projects
- Requires abutter notification
- Requires signatures of dam owner and Town or City Clerk
- All materials are submitted to DES Wetlands Bureau

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Package Includes…

1) Standard Dredge and Fill Application
2) Attachment for Dam Removal Projects

Requires correspondence with other agencies and local officials.

- Wetland impacts
- Wildlife impacts
- Social impacts
- Water quality and supply impacts
- Historic resource impacts
- Sedimentation impacts (both quantity and quality)
- Floodplain impacts
- Aesthetic impacts

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Step Four: Permit Review

- DES has 75 days to review completed applications
- Public hearing may be required in certain situations
- Successful applications result in:
  1) A State Wetlands Permit for Dredge and Fill Activities**
  2) Written Approval from the Dam Bureau

**Army Corps 404 permit is required. Typically covered by the Statewide Programmatic General Permit (SPGP).

Ready for Construction

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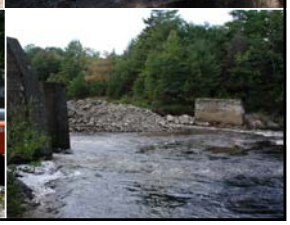
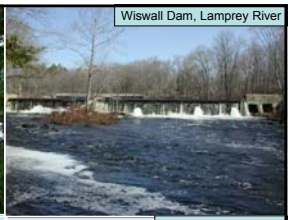
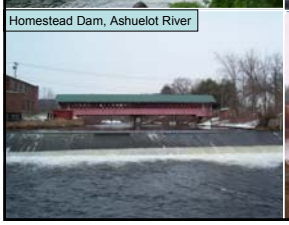
Bearcamp River Dam

South Tamworth, NH
Removed Sept. 2003

Height – 20 feet
Length – 230 feet
Built in 1929
Est. cost to remove - $120,000 (including studies)







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